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Association of American Medical Colleges Annual Meeting

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Alan Gregg Memorial Lecture

The Rising Supply of Physicians And the Pursuit of Better Health

Alvin R. Tarlov, M.D.

Alan Gregg was born in Colorado Springs on July 11, 1890, son of a Congregational minister. After graduation from Harvard Medical School, a residency at the Massachusetts General Hospital, and two years in the Medical Corps in France, Dr. Gregg joined the Rockefeller Foundation in 1919, where he served for 37 years until his retirement in 1958. For his first decade with the foundation he served overseas, mostly studying the details of medical education in Europe. In 1931 he became director of the Division of Medical Education, later to become the Division of Medical Science, and in 1951 he became vice president. Among his accomplishments he is best known for introduction of psychiatry into medicine and for supporting the Kinsey report on sexual behavior. He died in 1957, one year after his retirement, at his home on the Pacific at Big Sur, California (1).

During his career he was more than captain of a large grant program to medical schools. He was friend, counselor, and protagonist of humanism to most of the influential physicians and medical educators of that era. His knowledge of ancient culture, history, and literature, his erudite literary style, his wisdom, and his gracious manner made him the most sought after figure in medical education. His writings are remarkably prescient concerning the preparation of students for the practice of medicine and the needs and wants of patients. In his 1940 Linsly R. Williams Lecture at the New York Academy of Medicine titled "Humanism and Science" (2), Dr. Gregg wrote, ". . . some patients would rather be understood than be x-rayed, and rightly so."

For Christmas 1969, my mentor, Hans Hecht, gave me a volume by Alan Gregg, *For Future Doctors* (3), inscribed: "A favorite book of mine/Alan was somewhat of a fatherly advisor to many of us." Each point in my presentation is a tribute to Alan Gregg, who understood the needs of the times ahead.

From 1940 to 1970 the number of physicians per 100,000 population remained level at 140. Late in this period, however, a perception arose that the nation was headed for a serious shortage of physicians. The population growth associated with the "baby boom" of 1946 to 1964, the rising confidence that advancements in biomedical science would make more medical services for all highly desirable, and the promise that Medicare and Medicaid would expand medical services to previously uncared for segments of the population all pointed toward an impending shortage. Four influential national reports—the Bane report to the surgeon general in 1959, the Coggeshall report to the Association of American Medical Colleges in 1964, the Miller report to the President of the United States in 1966,

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This paper was prepared for delivery at the November 9, 1987, plenary session of the Annual Meeting of the Association of American Medical Colleges, Washington, D.C.

Dr. Tarlov is president of the Henry J. Kaiser Family Foundation, Menlo Park, California.

and the Clark Kerr report to the Carnegie Commission on Higher Education in 1970—all expressed a sense of national urgency; and all recommended rapid and vigorous action to increase the supply of physicians. Federal and state appropriations designed to implement the recommendations of these reports resulted. Funds were provided for facility construction and operating costs to increase the size and number of medical schools, and loans and scholarships were provided to attract more students to the expanded schools.

The results are shown in Figure 1 and Table 1. The three curves in Figure 1 illustrate the 23-year trend in number of medical schools, first-year enrollments, and graduates for the 127 allopathic medical schools and the 15 osteopathic schools combined. These curves were relatively flat in the decade prior to 1965. Since 1965 the number of medical schools rose 50 percent from 94 to 142 (attained in 1982), first-year enrollment doubled from around 9,000 to 19,000 (attained in 1983), and the number of graduates more than doubled from around 8,000 to almost 18,000 (attained in 1984).

The upswing in first-year enrollment from the foot of the rise to its crest was steep. During that 15-year period, percentage increases per year were 2.4, 6.5, 2.9, 6.8, 9.3, 8.0, 11.6, 3.1, 6.9, 2.6, 2.4, 3.5, 3.4, 2.7, 1.5 for an average increase of 5 percent per year. In contrast, the yearly percentage declines in first-year enrollment since 1983 have been minus 1.0, 0.4, 0.8, minus 0.6 percent. Therefore, throughout the next 15 years the number of medical school graduates will remain roughly double the number of 20 years ago; 16,000 in the year 2000, compared with 8,000 in 1965.

The cohort nature of these curves is essential for an understanding of manpower supply dynamics. From entry to medical school to cessation of practice is approximately 45 years. For the remain-

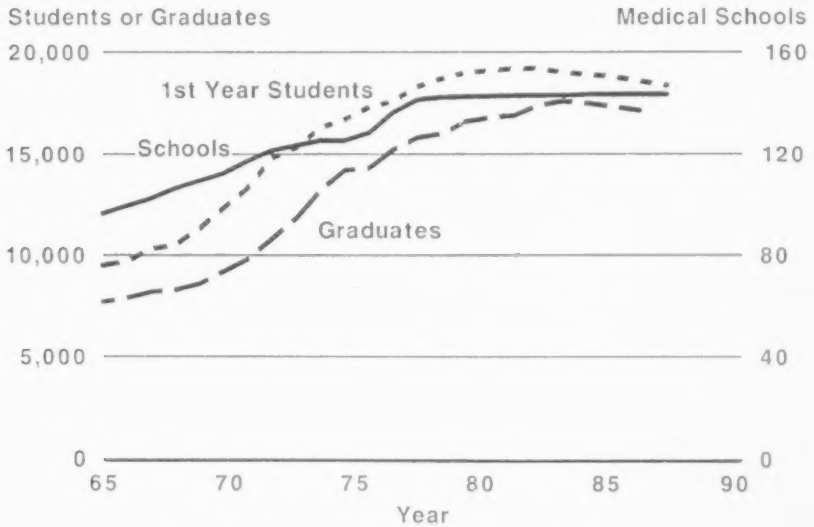

FIGURE 1

U.S. allopathic and osteopathic medical schools, first-year students and graduates, 1965–1987.

TABLE 1

Enrollment of First-Year Students and Graduates of U.S. Medical Schools, 1965–1987

Academic Year	Allopathic Schools				Osteopathic Schools			Combined		
	No. of Schools	Total First-Year Enrollment	New First-Year Enrollment	Graduates	No. of Schools	Total First-Year Enrollment	Graduates	Total No. Schools	Total First-Year Enrollment	Graduates
1965	89	8,759	8,554	7,574	5	464	360	94	9,223	7,934
1966	92	8,964	8,775	7,743	5	480	405	97	9,444	8,148
1967	95	9,479	9,314	7,973	5	509	427	100	9,988	8,400
1968	99	9,757	9,740	8,059	5	521	427	104	10,278	8,486
1969	101	10,397	10,269	8,367	6	577	432	107	10,974	8,799
1970	103	11,367	11,169	8,974	7	623	473	110	11,990	9,447
1971	108	12,278	12,088	9,558	7	670	483	115	12,948	10,041
1972	112	13,642	13,570	10,396	7	810	649	119	14,452	11,045
1973	114	[illegible]017	13,876	11,365	7	884	591	121	14,901	11,956
1974	114	[illegible]278	14,579	12,716	9	957	698	123	15,935	13,414
1975	114	[illegible]50	14,910	13,634	9	1,002	814	123	16,352	14,448
1976	116	[illegible]7	15,282	13,614	10	1,066	892	126	16,735	14,506
1977	122	[illegible]	15,493	14,391	12	1,207	965	134	17,325	15,356
1978	125	[illegible]013	16,054	14,966	14	1,297	1,003	139	17,910	15,969
1979	126	17,008	16,301	15,135	14	1,381	1,032	140	18,389	16,167
1980	126	17,205	16,590	15,673	14	1,467	1,129	140	18,672	16,802
1981	126	17,268	16,644	15,985	15	1,564	1,038	141	18,832	17,023
1982	127	17,254	16,567	15,802	15	1,618	1,315	142	18,872	17,117
1983	127	17,150	16,480	16,343	15	1,743	1,304	142	18,893	17,647
1984	127	16,997	16,395	16,318	15	1,714	1,484	142	18,711	17,804
1985	127	16,963	16,268	16,117	15	1,675	1,555	142	18,638	17,672
1986	127	16,819	16,103	15,830	15	1,665	1,579	142	18,484	17,409
1987	127	16,713	15,927		15	1,653		142	18,366	

Sources: Association of American Medical Colleges and American Osteopathic Association (first-year osteopathic school enrollment for 1965, 1970, and 1975 are author's estimates).

TABLE 2
Projected Growth of Internists

Physicians	1988	1998	Percent Increase
Total internists	103,680	140,870	36
General internists	59,490	74,340	25
Subspecialty internists	44,190	66,530	51
Cardiologists	12,610	17,950	42
Gastroenterologists	5,840	8,830	51
Hematologist-oncologists	6,130	9,550	56

Source: reference 4.

der of this century, new entry to practice from U.S. medical schools, now approximately 17,500, can be expected to be at the 17,000 to 16,000 level. However, attrition from practice, because of the 45-year cohort phenomenon, will be at the 1960s' rates, roughly 8,000, until around the year 2010. Therefore, with addition rates of 16,000 per year and attrition rates of 8,000 per year, there will be a substantial net gain of physicians in each of the next 25 years, continuing a trend begun in 1965 and lasting for 45 years.

Information for internal medicine, representing about 25 percent of all physicians, is typical of this remarkable growth (Table 2). By using standard demographic and actuarial methods for death, disability, and retirement, the number of internists expected for 1988 and for 10 years from now were calculated (4). There will be 140,000 actively practicing internists in 1998, an increase of 36 percent in just one decade. As shown in the last column, the growth rate of subspecialty internists will be twice that of general internists. Over the next 20 years, the band of difference between general and subspecialty internists will narrow progressively and reach parity by about the year 2008. For individual subspecialties in the next 10 years, there will be a 42 percent increase in the number of actively practicing cardiologists, a 51 percent increase in gastroenterologists, and a 56 percent increase in hematologists-oncologists. Adjusting for population growth, in this 10-year period alone the potential patient population for each individual physician will be reduced by 13 percent for the aggregate population of all physicians, minus 20 percent for internists and minus 33 percent for cardiologists.

The large increase in the number of actively practicing physicians during the 45-year period from 1965 to 2010 applies to almost all specialties as well as to internal medicine. For the United States, growth in the number of physicians has been and will continue to be approximately 2 percent a year every year. The growth rate of the general U.S. population during this same 45-year period will be less than 1 percent per year. At the start of this 45-year period in 1965, we had 140 physicians for 100,000 population. At the conclusion of growth in 2010, we will have 280 physicians for 100,000 population.

Effects of Increased Physicians

One consequence of a doubling of the capacity of the medical schools and brisk increases in the number of practicing physicians that is observable today—20 years before full growth has been completed—relates to physician work load. Each year the Center for Health Policy Research of the American Medical Association publishes results from its Socioeconomic

Monitoring System. The data derive from a lengthy survey instrument completed by approximately 4,000 physicians each year. In the five years from 1982 to 1986, there was a 9 percent reduction in the total number of patients seen, with 6 percent fewer seen in the office and 20 percent fewer seen in the hospital (Table 3, reference 5). Median net income after expenses rose 22 percent over the five years, but in real or deflated dollars this represents only a slight increase (the consumer price index rose 17.6 percent in the same period). A range of possible explanations for the decreased patient work load can be offered, including restraints on utilization imposed by government regulations and health plan contracts and changing work habits preferred by physicians who favor more leisure time. Nevertheless, a continuing brisk increase in the supply of physicians can also be invoked as an explanation for a declining patient work load.

In addition to the measurable effects of a rising physician supply, there are other "enabling" consequences. The rapid growth of prepaid price competitive health plans, the health maintenance organizations, with 30 million current enrollees and growth rates exceeding 20 percent annually, and still rising robustly, would not have occurred without a plentiful supply of physicians. The emergence of preferred provider plans, out-of-hospital surgery, and other cost-cutting developments has been facilitated by the availability of a plentiful supply of physicians willing to depart from traditional practice characteristics. The pro-competition endeavors in the 1980s to contain costs of medical services would not have been so readily implemented without the rising supply of physicians.

Another potential consequence of the rising supply of physicians could be a further evolutionary change in the health care system to the possible detriment of physicians. The pro-competition movement in health can be perceived as being ineffective. Health care expenditures continue to rise at two to three times the rate of inflation; surplus capacity has not been substantially reduced; there is no evidence that quality is being enhanced; and upwards of 30 million people do not have health insurance. In the years ahead policies will be considered by some plans—Medicare first—to identify selected physicians whose record indicates a more conservative approach to utilization of tests, drugs, and hospitals. Prospective budgeting with caps and more fixed or limited physician income plans will be introduced. A system of universal health insurance will be reconsidered. The freedom to experiment with more bold innovations, most of which will further

TABLE 3

Mean Number of Patients Seen by U.S. Physicians per Week and Median Net Annual Income of Physicians

Patients/Income	1982	1983	1984	1985	1986
Patients					
Total seen	129.1	123.4	118.1	117.1	117.7
In office	80.2	77.4	73.0	73.5	75.7
In hospital	32.3	32.9	28.4	27.2	25.8
Discharged from hospital		5.5	5.0	4.8	4.7
Length of stay (days)		6.0	5.7	5.2	5.3
Income (in thousands of dollars)	82.0	88.0	92.0	94.0	100.0

Source: reference 5.

limit the individuality of physicians, could not occur, in my view, without a supply of physicians greater than was present 20 years ago.

Another possible consequence of the rising physician supply could be a further lessening of the interest of college age students in medicine as a career. This will be discussed later.

Medicine's Conceptual Basis

The concept of medicine as a formally recognized biological science will soon be 100 years old. In the late 1880s sufficient knowledge regarding the biology of disease had accumulated to allow medicine to be considered a science and a bona fide intellectual discipline. The visionaries of that time advocated that medicine should join its sister sciences within the universities. When confronted with the issue as to where within the university structure medicine should reside, decisions were made to place it in that sector of the university devoted to the natural sciences. Disease was thought to be an aberrancy of the work of nature. Medicine became separated from fields devoted to the works of man, the humanities and the social and behavioral sciences. It is not surprising, therefore, that 100 years later the concepts that underlie medicine derive largely from the natural sciences. The state of health is measured using biochemical and physiological parameters. Medical interventions are almost entirely biologic intrusions. Concepts derived from study of the works of man, how our social systems are organized and how they influence health, and the limitless variety of human reactivities to social circumstances have not penetrated the exclusive domain of the works of nature. Charles Odegaard has written on this topic (6).

The centennial of the formal acceptance of medicine as a biological science should provoke a fresh examination of medicine's conceptual basis. Three concepts seem especially important for discussion: (*a*) What is health? (*b*) What are the determinants of health? (*c*) What interventions in health are most appropriate for tomorrow's physicians?

PARADOX IN HEALTH

Health and ill health do not bear a dichotomous relation to each other. Rather, a continuous spectrum extends between good health and poor health. Currently available information on health status allows individuals, communities, or whole populations to be plotted at their respective positions along the spectrum. Some important indicators of health include infant and maternal mortality, life expectancy, morbidity and mortality rates from specific causes, body weight, serum lipid concentration, blood pressure, and disability figures. An entity's position along the spectrum can change with time by, for example, advances in sanitation and nutrition, economic circumstances and education, health care, or social norms and policies.

During the 100 years of medicine as a biologic science, great strides have been made toward improved health. The statistics for life expectancy from birth speak clearly: 49 years in 1900 and 75 years today. Yet, as Leonard Sagan points out in his new book, *The Health of Nations* (7), improvements in U.S. life expectancy in the past three centuries cannot be attributed to advancements in medical care, nutrition, or sanitation. Social factors, including level of education and economic circumstances, are the strongest correlates with life expectancy.

The great paradox in health in the United States is that the nation ranks first in the world in per capita health care

expenditures (8) and first in the application of advanced technology but 10th to 20th in most statistics describing health status (for example, 10th in maternal mortality [9], 17th in infant mortality, and 19th in life expectancy). In 1986 the U.S. spent $458 billion on health care, $1,837 per person (10). Yet, most industrialized nations that spend considerably less have lower infant mortality and greater life expectancy. In the United States,

1. We join a few other western industrialized countries in leading the world in the prevalence of major chronic diseases, including heart disease, cancer, and stroke.

2. Each year some 1.5 million Americans suffer a heart attack; heart disease causes an estimated 770,000 deaths each year, or 38 percent of all deaths (11).

3. 300,000 Americans die each year from causes directly attributable to cigarette smoking.

4. The levels of illicit drug use by youths is greater than can be found in any other industrialized nation in the world (12).

5. We lead in having 80 percent of the worldwide cases of AIDS.

6. We have the highest rate of adolescent pregnancy, abortion, and childbearing among all western developed countries (13).

Surely the paradox of high health care expenditures and less than optimal health status cannot be attributed either to failures in health care delivery, as egregious as some of the defects are, or to failures of immunization and sanitation. Rather, dramatic shifts in disease patterns in the last 100 years suggest other factors. In 1900 the five leading causes of death in the United States were pneumonia and influenza, tuberculosis, acute intestinal infections, heart disease, and stroke. By 1985 the order became heart disease, cancer, stroke, accidents, and chronic lung disease. The shift from an earlier preponderance of infectious disease to the current prevalence of chronic disease, the rise in mortality from cardiovascular disease in the first half of the 20th century and the decrease in the past 20 years, the increasing prevalence of some types of cancers and the decrease in others, and immigrants' single-generation adoption of the disease patterns of their new home countries all suggest that influences external to the individual are major determinants of health and disease.

DETERMINANTS OF HEALTH

Using the total economic costs of all illness as measured by Rice and colleagues (14, 15) and the proportion of all illness attributable to antecedent negative health behaviors (16), we have calculated the proportion of the economic costs of illness ascribable to their behavioral antecedents (Figure 2). The antecedents, take note, are principally social rather than genetic or biologic. As Figure 2 demonstrates, the combination of tobacco use, alcohol misuse, motor vehicle crashes, other injuries, and substance abuse account for 52 percent of the total economic costs of illness. Dietary factors, lack of physical fitness, and unattended hypertension account for a high proportion of the remaining 48 percent. A recently published project by the Centers for Disease Control and the Carter Center of Emory University (16) indicates that two-thirds of all disease and premature death is due to behavioral and societal characteristics and, therefore, is theoretically avoidable. These avoidable factors undoubtedly are major contributors to the station assumed by individuals, communities, and whole populations along the spectrum of health. Negative health behaviors do not arise by chance. They reflect the social circumstances immediately surrounding a per-

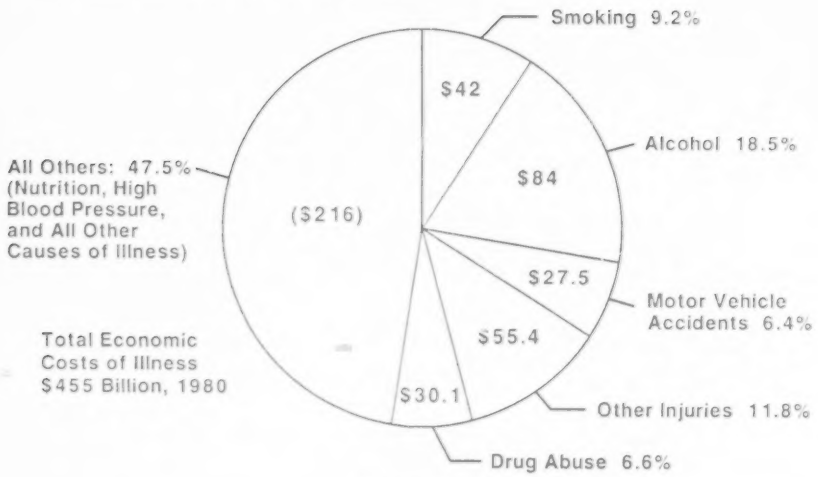

FIGURE 2
Behavioral antecedents and costs of illness (in billions of dollars), United States, 1980. (Sources: references 14 and 15)

son's life. Important surrounding circumstances include: cultural beliefs; family customs; fads; fashions; social norms; commercial practices including advertising and marketing strategies; the content of television, radio and newspapers; political and economic features; local ordinances and laws; and regulations. The fundamental characteristics of a society determine the behaviors of its members, and these behaviors are the major determinants of health.

Socioeconomic status, including educational attainment, income, and occupation, has been demonstrated to be a powerful determinant of health. Marmot (17) studied the age-adjusted mortality rates of 17,000 civil service employees in the United Kingdom for 10 years. The civil servants were analyzed by job classification, the highest being the senior executives and the lowest being manual laborers. An inverse relationship between job class and death rate was demonstrated (Figure 3). The lower the job class, the higher the death rate. The vertical scale in the figure is logarithmic and may conceal the magnitude of the differences. The manual workers had death rates two times greater than the next grade, three times greater than the third grade, and four times greater than the senior executives. The results defined a continuous inverse relationship over the entire spread of socioeconomic indicators and even held in a single job class when the members were subclassified according to educational level.

Similar relationships have been found in every society in which they have been studied. For populations as a whole, persons with higher socioeconomic status on the average exhibit better health status. A specific level of health cannot be explained fully by nutrition, clothing, housing, and access to medical care. Factors associated with education, occupational level, and income might account for as much as half of the socioeconomic-health relationship. Education seems to play an important role by conditioning tastes and preferences, affecting compliance with

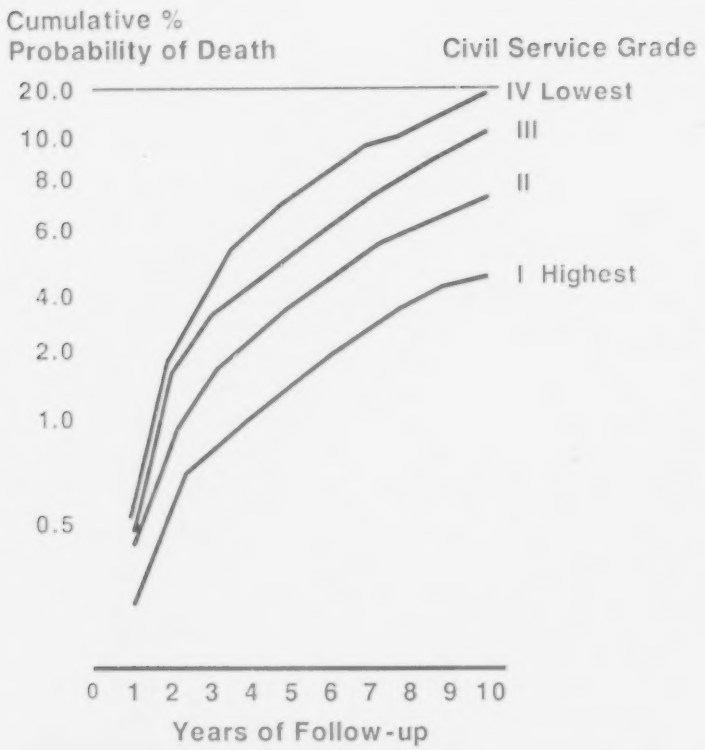

FIGURE 3

Relationship between job class and death rate of 17,000 United Kingdom civil service employees. (Source: reference 17)

medical regimens, and influencing personal commitments to maintain health.

Perhaps low self-efficacy among the less well off—a sense of inability to make a difference in the circumstances of one's life—lowers resistance to disease. Much more research needs to be done. Nevertheless, lower socioeconomic status does lead to poorer health and less favorable responses to therapy. Interventions focused on improving health must take into account the concept that surrounding social circumstances in themselves lead to disease and death quite independently of the effects of genes, unhealthy behaviors, and the availability of health care.

The representation of the determinants of health depicted in Figure 4 attempts to summarize the relative roles of biological phenomenon, individual behavior, and social circumstances. The determinants are the precursors of the biological processes by which disease is manifest. The determinants are overlapping and interactive. Certainly some aspects of individual behavior result directly from powerful social influences. For example, diet, tobacco use, drug abuse, and adolescent sexual activity are influenced by social norms, including television content and advertising. These social norms, tobacco smoking, for example, ultimately are sus-

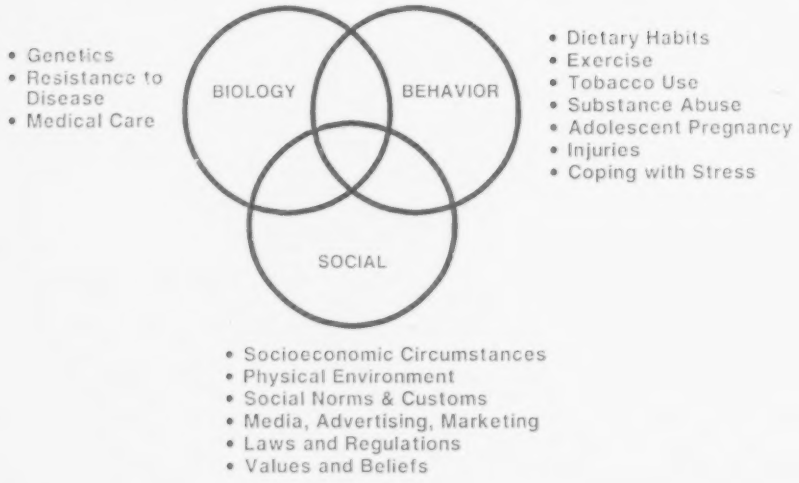

FIGURE 4
Relative roles of biological phenomena, individual behaviors, and social circumstances as determinants of health.

tained by becoming encoded in laws and regulations, such as subsidization of tobacco farming and low excise taxation of tobacco products. Similarly, the social influences affect powerfully the effectiveness and accessibility to medical care, as exemplified by the fact that 30 million Americans are without health insurance, and health care has a weaker effect on the health of lower socioeconomic groups than on the middle class. Considering these factors and making gross estimations, we think that each of these three broad categories of determinants accounts for approximately one-third of the influences determining an individual's or a population's station along the spectrum of health.

Clearly, advances in medical care, both diagnosis and treatment, are astonishing. I do not wish to imply that biology's ascendancy in medicine has reached a zenith. In the decades ahead, biomedicine will continue to introduce new treatments that promise to rescue large numbers of people from the suffering of disease. As a primary determinant of health, however, medical care plays only a modest role.

INTERVENTIONS

Perhaps the U.S. paradox in health—larger expenditures for health care but less favorable health status compared with many other nations—can be explained in part by the large resources devoted to medical care, which plays a relatively subsidiary and after-the-fact role as a determinant of health, while too little attention is given to the more fundamental underlying characteristics of U.S. society and individual behavior, some of which are powerful contraindicators of good health.

As illustrated in Figure 5, ill health can be viewed as being at the apex of a pyramid of antecedent underlying factors. Cardiovascular disease will be used as an example. It accounts for about a million deaths per year and half of the total economic costs of illness. Employing the conceptual framework that has grown out of

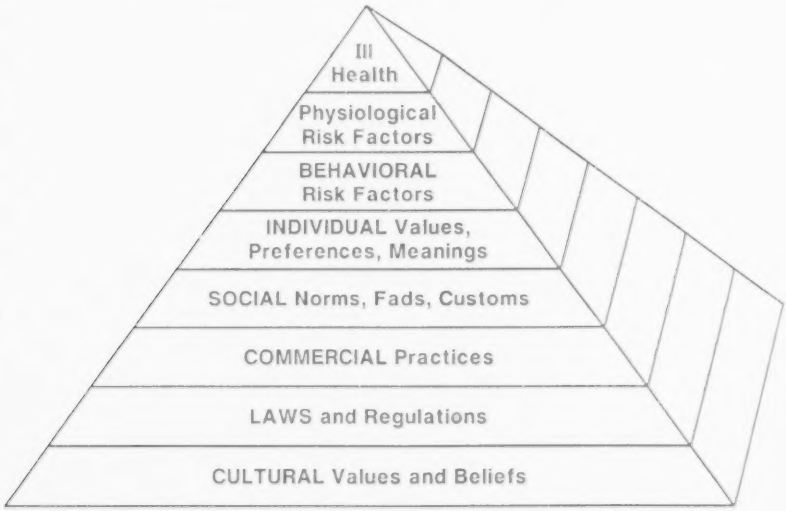

FIGURE 5
Antecedent underlying factors of ill health.

biology, we have focused on genetic causes or new techniques to crush an atherosclerotic plaque or transplantation. Genetic factors clearly play a role. But genetic factors related to congenital hypercholesterolemia account for only a minor portion of cardiovascular disease. Multiple genetic factors acting in concert may provide a predilective tendency to cardiovascular disease, but the predilection needs to be triggered by external factors and can be overwhelmed by them. The physiological risk factors that precede and lead to cardiovascular disease include hypercholesterolemia and several others. But the physiological risk factor (in this example, hypercholesterolemia) stems directly from antecedent behavioral risk factors, including a diet in which 40 percent of the calories are derived from fat.

Each individual has a system of personal values, preferences, and meanings that not only condition his behaviors but also determine his reactions to ill health and to medical care. Individual values and behaviors are not selected by individuals or populations at random but are reflections of social norms, fads, and customs, such as the U.S. preference for animal fats and dairy foods. The social norms are reinforced by commercial practices, such as the production, distribution, advertising, and marketing of beef and dairy products that are high in fat and cholesterol. These commercial practices frequently become enduring by becoming fixed in laws and regulations. For example, agricultural subsidies provide powerful incentives for the production, distribution, and marketing of high fat milk and its products, and these same subsidies penalize economically the production and marketing of low-fat milk products. Similarly, the U.S. Department of Agriculture's regulations on labeling of meats and processed foods encourage and sustain high fat diets.

Underlying and supporting the pyramid of causation are cultural values and beliefs. Americans place a high value on

a free economy with minimal regulation. We place the highest value on individual freedom and free choice. The freedom to promote, offer for sale, and to purchase deathly products such as animal fat, cigarettes, and firearms is fastidiously protected by the same populace that is celebrant with these freedoms in the bicentennial year of our constitution. Further on values and beliefs, individuals, business, governments, and professional societies lack the will to think and behave with the long-term health of individuals as a principal concern, and Americans have an unrealistic dependency on health care and especialiy on the newer high technology interventions to assure individual well-being.

Lung disease, diabetes, a large fraction of cancers, and gastrointestinal disease could be used just as effectively to illustrate the working of the pyramid of causality.

By far the overwhelming concern of the physician has been at the top of this pyramid, that is, the diagnosis and treatment of ill health. The physiological risk factors, which are the direct physical and chemical accompaniments of ill health, are attended to by the physician, but physicians pay scant and ineffective attention to behavioral risk factors and their roots in antecedent circumstances. The biopsychosocial concept of medicine introduced by Dr. George Engel of the University of Rochester School of Medicine and Dentistry attempts to broaden the medical paradigm by including the humanistic dimensions of each individual—and that is important—but that concept also remains too narrow for a revised medicine. Most practicing physicians, medical educators, and medical societies leave topics below the level of physiology to nurses, allied health professionals, or to chance or to research by public health specialists and social scientists. Medical education remains embedded in a narrow view made restrictive by an exclusive biologic perspective. Perhaps our predominant focus on diagnosis and treatment through the narrow-angle lens of biology was appropriate for the past century of medicine. Certainly into the future, patients will need physicians for their traditional roles, and in that physicians are irreplaceable. Biology will continue as a necessary footing for medicine, but biology is much too narrow a base upon which to build an effective approach to health and to medical care when health fails.

Revised Conceptual Framework

Advancements in science, both in the natural and in the social sciences, permit beneficial interventions to be made in fundamental ways before disease and premature death become inevitable. Deeper into the pyramid, interventions may be more effective. At another time and in another era, concentration at the top was appropriate. Now, with awareness of the paradox in health and with new knowledge on the determinants of health, the vista of concern of physicians and their professional organizations should be broadened. The place to start is in medical education.

Medicine needs a revised conceptual framework. Biologic concepts need to be joined with concepts stemming from social, economic, governmental, and cultural phenomena. Health should be understood in sociocultural and behavioral as well as biological terms. New roles for physicians and new interventions of great potential benefit to patients await our enthusiastic embrace. The objectives of a physician in the care of a patient and as a professional in society need to be cast in a new configuration. Until this is accomplished, attempts to improve medical

education will be of limited benefit to the health of patients.

A limited biotechnical view of medicine is unattractive to young students in college thinking of their futures. They have been immersed in broad social and humanistic studies. They are interested in the worth of societal practices. They seek a future in which they can play a role in improving life's quality, both for individuals and for society generally. But, increasingly these young educated idealists perceive that medicine is an opportunity to become a disease technician. They have a disquieting concern that life as a physician taken as a whole may be lacking in significance. Although other factors interplay, the narrow focus of medical education gnaws at the root of the declining numbers of applicants to medical school, 28,123 for the class that entered in September 1987, down from 31,323 the previous year—and still falling.

The two parallel developments—the impending restructuring of medical practice and the need to restructure the conceptual framework of medicine—converge to create a windfall of opportunity. The rising supply of physicians, the U.S. paradox in health, a more profound understanding of the determinants of disease, and the necessity to make medicine more attractive to prepared youth beg for a reformulated conceptual framework for medicine. The timing is right. The needs of both medical education and medical practice offer opportunities for fundamental restructuring.

It should not escape our notice that the declining interest of college students had a parallel in a declining interest of medical school faculty members in becoming a medical school dean. It has been the worst of times for deans. However, the imperative to formulate a new conceptual basis for medicine offers the once-in-a-century opportunity for an ambitious remodeling of the substance of medical education, the characteristics of the faculty of medicine, and the intersection of the medical school with other components of the university and with the sociocultural environment in which patients live and disease develops. These could become the best of times for deans. That is one meaning of the rising supply of physicians.

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